

aeration chamber of the wastewater treatment plant forces a specific current or pattern of circulation which sweeps fluid from every portion of the plant such that solids will remain well mixed in solution instead of accumulating as sludge. This exposes all solids to efficient digestion by aerobic bacteria. In a preferred embodiment, an external oxygenation gas source supplies oxygenation gas, preferably air, through a flexible drop line or air line to the diffuser for release into the aeration chamber. The release of oxygenation gas at the diffuser location forces the defined current pattern in the tank while providing a sufficient supply of oxygen for the growth of the aerobic bacteria which digests the organic solid wastes. While the diffuser location can be a single location close to the side wall and near the bottom of the wastewater treatment plant, a preferred embodiment includes placing the diffuser close to the side wall and close to the bottom such that the diffuser is substantially below the wastewater treatment plant inlet. When multiple air lines and diffusers must be used to provide sufficient quantities of oxygen, a preferred embodiment includes grouping all drop lines and diffusers in close proximity below the wastewater treatment plant inlet. Thus, the diffuser system, if comprised of multiple diffusers, is positioned such that the individual diffusers are in sufficiently close proximity to one another and adjacent the intersection of the side wall and the bottom wall such that the upwardly generated

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wastewater currents induce a branched current at the surface of the liquid in the aeration chamber, the branched current having a first run that moves in a first direction around the periphery of the aeration chamber and a second run that moves in the opposite direction around the periphery of the aeration chamber, the first and second runs meeting in an area generally diametrically opposite the inception of the branched current.

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In column 5, in the paragraph beginning at line 12:

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The defined current or circulation pattern produced by this embodiment, as shown in FIG. 1, is such that oxygenation gas forces the fluid within the aeration chamber to move upwards in direction 100 from the diffuser until it reaches the surface of the liquid within the chamber. This forces a current which travels around the conical partition in both directions, as indicated by the numbers 102 and 104. As these currents meet on the opposite side of the partition, the intersection of the outer currents causes a downwardly flowing current 106 which flows to the bottom of the aeration chamber which creates main currents 108, 110, and 112 that sweep across the bottom in all directions. The water sweeping generally in a straight line across the bottom of the vessel in direction 108 moves with the greatest speed and serves to move any solid falling out of the clarifier chamber back into circulation in the aeration chamber, thus preventing any

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accumulation of solids in the bottom of the aeration chamber. The water moving generally around the outer perimeter of the vessel in directions 110 and 112 moves at a slower speed but with enough speed to scour the edges of the vessel and to sweep the solids into circulation. All areas of the bottom of the vessel are forced into circulation. Those areas intermediate between the path straight across the bottom of the vessel and the path around the outer perimeter travel respectively intermediate speeds. While FIG. 1 shows the entire circulation pattern, FIG. 5-7 show different views of parts of this pattern. As depicted in Figs. 1 and 6, the [air] injection [source, e.g., a diffuser] system[,] generates an area of aerating bubbles adjacent the intersection of the side wall and the bottom wall that induces the current flow shown in Figs. 1 and 6. Thus, assuming that direction 100 in Fig. 1 depicts the current flow of the wastewater induced at an injection area adjacent the intersection of the side wall and the bottom wall of the aeration chamber, a branched current having runs indicated by 102 and 104 is produced. Accordingly, multiple [aeration sources, e.g., multiple] diffusers [40.] could be positioned in sufficient proximity to one another such that [upward current flows from the injection area produced the flow paths indicated by 102 and 104] the current or circulation pattern depicted in Fig. 5 is achieved.

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